

Los Alamos National Laboratory marks 20 years without full-scale nuclear testing

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LOS ALAMOS, New Mexico, Sept. 26, 2012—Two decades ago the last full-scale underground test of a nuclear weapon was conducted by Los Alamos National Laboratory at the Nevada Test Site. The test, code named “Divider,” was detonated on Sept. 23, 1992 as the last of an eight-test series called “Julin.”

The test had an announced yield less than the equivalent of 20,000 tons of TNT. The purpose of the test, also announced at the time, was “to ensure the safety of U.S. deterrent forces.”

Divider was the last of 1,030 nuclear tests carried out by the U.S. The first nuclear test, Trinity, also conducted by Los Alamos, took place in southern New Mexico 47 years earlier on July 16, 1945.

Early in September of 1992, Congress adopted the Hatfield-Exon-Levin amendment to the Energy and Water Development Appropriations bill calling for a nine-month moratorium on nuclear testing. In 1991, Mikhail Gorbachev unilaterally declared a halt on all Soviet nuclear tests. Because of this, Los Alamos scientists were well aware that Divider might be the last U.S. test for a while, though they did not envision a future completely without testing.

Los Alamos physicist Gary Wall was part of the two-person design team for the Divider test. "We knew there was a short period of time to conduct a few tests before the moratorium took effect," said Wall, "so there was a lot of discussion surrounding the importance of the last tests. Of course we still believed there would be many more than there were."

Shortly after the Divider test, the Energy and Water bill including the Hatfield-Exon-Levin amendment was signed into law by President George H.W. Bush mandating the nine-month moratorium on full-scale nuclear testing, a mandate that has been extended by every subsequent U.S. President into the present day.

"Once the moratorium went into effect," said Wall, "there were many high-level discussions about what kind of science program we would build to take care of the stockpile without testing—this ramped up very quickly once it was clear the moratorium was serious." These discussions led to what was eventually called the Stockpile Stewardship Program.

"Over the past 20 years, the United States has been able to innovate and develop the tools we need to keep our stockpile safe, secure, and effective without underground testing," said NNSA Administrator Thomas D'Agostino. "We have the world's leading scientific facilities, the world's fastest computers, and the world's brightest minds working to ensure that we never again have to perform nuclear explosive testing on U.S. nuclear weapons."

"Because of the talent, intellect, creativity, and determination of the scientists, engineers, and technicians at Los Alamos, and across the NNSA's nuclear enterprise, we have been able to deliver on the promise of Stockpile Stewardship for 20 years without full-scale testing," said Laboratory Director Charlie McMillan. "It is our most important job, one that will continue well into the future."

The Stockpile Stewardship Program carried out by scientists and weapons experts at Los Alamos National Laboratory, Lawrence Livermore National Laboratory, Sandia National Laboratories, and the Nevada National Security Site (formerly the Nevada Test Site) has significantly advanced the nation's ability to understand the stockpile without nuclear explosive testing through analysis of legacy data, new data from sub-critical experiments, supercomputer modeling and simulation, and other non-nuclear experiments.

Facilities and capabilities at Los Alamos that have enabled the successes of Stockpile Stewardship include the Dual Axis Radiographic Hydrodynamic Test (DARHT) facility, the Proton Radiography facility, the Chemistry and Metallurgy Research facility, the Plutonium facility, and a wide variety of dynamic experiments facilities.

Computing advancements have include the development of massively parallel computers like the Connection Machines CM-5 and the "Q" supercomputer—and the more modern computing "clusters" like Roadrunner (the first to reach a million billion calculations per second in 2008) and the Cielo and Luna supercomputers now shouldering the bulk of classified, weapons-related computing at Los Alamos.

According to Wall, data from the Divider test is still applicable today. “Divider was a rousing success,” he said, “it clearly demonstrated a concept that remains viable for future stockpile options.”

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